HERMANN
MEDIZINTECHNIK

Endoscopic Units

Advanced units for endoscopic surgery

Endoscopy

HERMANN
MEDIZINTECHNIK

Since more than 50 years:

Quality and Safety

Know How and Innovation

Technology and Precision

Service and Flexibility

Quality Management:

Certified according to: ISO 13485; Annex II, section 3 of the directive 93/42/EEC

Our Products:

Instruments for MIS (Laparoscopy, Hysteroscopy, Arthroscopy, Urology)

Endoscopy units

Electrosurgery and accessories

Plastic surgery

Titanium-implant-systems for maxillo-facial as well as hand- and radius surgery, mandibular reconstruction

Scissors and micro-scissors, also with TC-inserts or "super cut"

Instruments for general surgery

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We reserve the right for alterations.

LIGHTSOURCE

LED 1000 - HIGH INTENSITY LIGHTSOURCE

- Low noise, low heat conduction
- Electronical light control via buttons
- Pure daylight quality
- Waterproof touch control panel

LED 3000 - HIGH INTENSITY LIGHTSOURCE

- PHASER ® technology included
- Low noise, low heat conduction
- Pure daylight quality
- Waterproof touch control panel

	H90-500-100	H90-500-300
Type	**HLED-100**	**HLED-300**
Lamp	Daylight quality, 6000-6500 K	
Lifetime	> 20.000 hr	> 10.000 hr
Light guide connection	Storz adapter	
System	Power supply: 100/240 VAC, 50-60 Hz Fuses: 2 Fine fuses, 5x20 mm, delay 6,3 AT (I=1500A)	
Power consumption	90 VA	200 VA
Video In	1x Video automatic Version	
Standard	Protection class: I Application part: Type BF IEC 601-1, EN 60601-1; classification acc. 93/42/EEC: I	
Dimensions (WxHxD) mm	355 x 103 x 253	355 x 120 x 340
Weight	4.9 kg	10.6 kg
Delivery contains	Light source, mains cable, user manual	

Xenon Light Sources

The HX-0100 / HX-0180 / HX-0300 offers the professional user the most advanced pure day light sources (5600°K colour temperature).

It contains an improved high intensity and low heat conductive XENON lamp.

LAMP

The built-in lamp is a specially developed XENON gas discharge lamp, filled with non-polluting XENON gas. The lamp design is optimized for endoscopic applications. Its design features a high efficiency reflector (and lens-system HX-300) which focusses light more effectively on the fiberoptic light guide. When the lifetime of the lamp (500 hrs.) has expired, the lamp is simply replaced by a new one within minutes - no tools and no adjustments are required.

LIGHT CONTROL

The output intensity is controlled steplessly via a motor driven, mechanical diaphragm. This ensures a constant colour temperature. The output intensity is set by push buttons.

CONNECTION

An interchangeable adapter system for all types of endoscopes, fibrescopes and microscopes ensures that the light sources can be operated in all applications. For more flexibility the light source is available with a TURRET-adapter system. The TURRET-adapter contains four adapters (Storz / Wolf / Olympus / ACMI) in a simple turning mechanism.

QUALITY

The light sources fulfill all essential safety demands. The rugged desk housing and the flat, waterproof touch control panel withstands all daily used requirements.

For highest safety requirements, we offer the HX- series also with built-in 150 Watt Halogen lamp as emergency illumination. In case of lamp defects during operation the emergency lamp is automatically switched on.

	H90-100-001	H90-180-001	H90-300-001
Type	**HX-0100**	**HX-0180**	**HX-0300**
Lamp	100 W	180 W	300 W
Power supply	110/115 VAC and 230/240 VAC, switchable		
External dimensions	355 x 120 x 340 (W x H x D)		
Weight	9.0 kg	9.0 kg	10.5 kg
Power consumption	185 VA	280 VA	370 VA
Lightguide adapter	Interchangeable, one included, please state lightguide fitting		
Lamp	Xenon arc gas discharge lamp, elliptical cold light reflector		
Protective class	Type BF		

Spare parts:		
Xenon light lamp	100 W	H90-100-001E
Xenon light lamp	180 W	H90-180-001E
Xenon light lamp	300 W	H90-300-001E

Options: With TURRET, Wolf, Storz, Olympus, ACM-adapter-system — H90-XXX-**002**

With built-in 150 W halogen lamp as emergency illumination — H90-XXX-**003**

Delivery contains: Light Source
Mains Cable
User manual

Halogen
Light Source

The HH-2250 is a universal and easy to use high-intensity HALOGEN light source. It can be used for nearly every endoscopic application. Two lamps ensure uninterrupted working if one lamp breakes down or offer expanded possibilities by using different adapters for different light guide systems.

Special reflector lamps and infrared filters stand for best light coupling.

A softstart electronic expands the life time of the HALOGEN lamps.

The intensity is controlled by mechanical diaphragm without changing the colour temperature.

Spare parts:
HALOGEN light lamp 250W H90-250-000E

Options:
With 2 lamps and 1 output
(no simultanous use) H90-250-**001**
With 1 lamp and 1 output H90-250-**002**

Delivery contains: Light Source
Mains Cable
User manual

HH-2250	**H90-250-000**
Power supply	110/115 VAC and 230/240 VAC, switchable
External dimensions	355 x 120 x 340 (W x H x D)
Weight	8.0 kg
Power consumption	250 W
Lightguide adapter	Interchangeable, one included, please state lightguide fitting
Lamp	2 halogen reflector lamps, 250W, 24V
Colour temperature	3600 K
Protective class	BF

Digital 1-CCD Video Camera

HC-1000 represents our range of 1-CCD-cameras for endoscopic applications. Full digital signal processing guarantees true colour reproduction and outstanding image quality. A high sensitive, high resolution 1/3“ CCD ensures high clarity and sharp detailed images for every endoscopic application. It is easy and flexible to use. The HC-1000 can be adjusted individually via integrated On-Screen-Menu. The Camera head is very small and light-weight. It can be immersed in disinfectant solution for sterilisation (using the attached cap).

HC-1000	H97-200-001
Camera head:	Aspect ratio: 4:3 **Image sensor: 1/3” CCD** **Immersible (using the attached cap)**
System:	Power supply: 100/240 VAC, 50-60 Hz Fuses: 2 Fine fuses, 5x20 mm, delay acting 3,15 AH (I=1500A) Power consumption: 20 VA Image resolution: PAL 752 x 582/ NTSC 768 x 494 TV resolution: > 470 lines Sensivity: < 1 lux (1/1.4) White balance automatically, with data hold shutter speed PAL (NTSC): 1/50 (1/60) to 1/100.000 sec
Video out terminal:	2x Video; 2x S-Video; 1x Y-Pb-Pr (Component); 1x SDI; 1x USB 2.0
Standard:	Protection class: I Application part: Type BF IEC 601-1, EN 60601-1; classification acc. 93/42/EEC: I
Dimensions:	Control unit (WxHxD): 355 x 103 x 253 mm; 4,4 kg
Video system:	PAL/NTSC
Delivery contains:	CCU, camera head with 3m cable, mains cable, Y/C cable, BNC cable, HDMI - DVI cable, HDMI cable, User manual
Series:	On-screen-display, Menu, Titel generator option PS/2, Capture module (image, video), HDMI out, Zoom function
Options:	Freeze function, Remote camera head, Remote footswitch Other options on request.

WHITE BALANCE
White Balance is done automatically via push-button.

WINDOW FUNCTION
Window Function is programmed for different brightness measurement fields in case of difficult illumination conditions. Size can be adjusted via On-Screen-Menu.

ON-SCREEN-MENU
Camera settings (like contrast, brightness, window size) can be made in the On-Screen-Menu. Settings are stored in memory.

Keyboard with connector
for Digital 1-CCD and 3-CCD Camera H97-200-001-K

HD Digital 1-CCD Video Camera

HHD-1100 is a single chip video camera of the latest generation with excellent image quality and outstanding colour reproduction for professional requirements.

The HHD-1100 can be used for every endoscopic application with high demands. It is easy and flexible to use.

The HHD-1100 can be adjusted individually via integrated On-Screen-Menue. Settings are stored in an internal memory. The camera head is very small and light weighted designed. A wide range of different TV-Adapters can be attached to the C-Mount thread to choose the best focus length to the procedure.

DIGITAL ZOOM
Up to 2,5 digital Zoom via push-buttons.

FREEZE FUNCTION
The image on the screen can be freeze via push-bottons on the camera head or an optional footswith.

ON-SCREEN MENU
Camera settings (like color, brightness, area) can be made in the On-Screen-Menu. Settings are stored in memory.

3 USER SETTINGS STORABLE

AREA FUNCTION
Is a multitude of different brightness measurement fields. Quantity of measurement fields and form of this area is changeable. This function controls the Shutter-Level for best illuminated picture.

STERILISATION
Camera head with cable and connector (using attached cap) can be immersed in a disinfectant solution.

CHARACTER GENERATOR
Creates on-screen-information on all video outputs by using standard PS2 keyboards (keyboard optional see page 7).

OPTIONAL ACCESSORIES
- waterproof keyboard
- footswitch

Delivery contains
CCU, camera head with 3 meter cable, mains cable, HDMI-DVI cable, HDMI cable, RGB cable, Y/C cable, BNC cable, user manual.

HHD-1100	**H97-202-001**
Video system:	PAL, NTSC
CCD-sensor:	1/3" MOS
Video resolution:	>1000 TV-lines horizontal
Aspect Ratio:	16:9
S/N:	54 dB
Resolution:	Full HD 1920 x 1080 pixel
Sensitivity:	< 3lx
Outputs **Digital out:** **Analog out:**	 1 x HDMI /DVI 1 x YPbPr / RGB 1 x Y/C (Pal/NTSC) 1 x CVBS (Pal/NTSC)
Settings	On-Screen-Menu 3 User setting storable
Power supply	100 – 240 VAC
Dimensions (WxHxD)	CCU 353 x 103 x 253 mm Head 32 x 32 x 85 mm
Weight	CCU 4,7 kg Head 97 g
Head	C-Mount thread, immersable three push-buttons for remote high flexible cable: 3 meter
Class / Type	1 / BF
Manufactured and tested acc.	IEC 601-1 / EN 60601-1 · MDD 93/42/EEC

HD Digital 3-CCD Video Camera with Zoom

HHD-3100 is a 3-CCD video camera of the latest generation with excellent image quality in High Definition and outstanding natural colour reproduction for professional requirements. The HD camera can be used for every endoscopic application with high demands. It is easy and flexible to use.

The HHD-3100 can be adjusted individually via integrated On-Screen-Menu. Settings are stored in an internal memory. High speed, complete digital image processing, separated for red, green and blue colour channels, enables high end image qualitiy.

HHD-3100	**H97-202-003**
Video system:	PAL, NTSC
CCD-sensor:	3 x 1/3 CCD
Video resolution:	>1000 TV-lines horizontal
Aspect Ratio:	16:9
S/N:	54dB
Resolution:	Full HD 1920 x 1080 pixel
Sensitivity:	< 3lux (1/1.4)
Outputs **Digital out:**	 2 x HD SDI 1 x HDMI / DVI 2 x CVBS
Analog out:	1 x YPbPr 1 x Y / C (Pal / NTSC) 1 x S-Video (Pal / NTSC)
Settings :	On-Screen-Menu
Power supply:	100 – 240 VAC / 50-60 Hz
Dimensions (W x H x D)	CCU 353 x 103 x 253 mm Head 77 x 54 x 39,5 mm
Weight:	CCU: 4,7 kg Head: 168 g
Head:	C-Mount thread, immersable two push-buttons for remote high flexible cable: 4 meter
Class / Type:	1 / BF
Manufactured and tested acc.	IEC 601-1 / CE , EN 60601-1, 93/42 ECC

DIGITAL ZOOM
Up to 2,5 digital Zoom via push-buttons.

FREEZE FUNCTION
The image on the screen can be frozen via push-buttons on the camera head or an optional footswitch.

ON-SCREEN-MENU
Camera settings (like color, brightness, area) can be made in the On-Screen-Menu. Settings are stored in memory.

3 USER SETTINGS STORABLE

AREA FUNCTION
Is a multitude of different brightness measurement fields. This function controls the Shutter-Level for best illuminated picture.

STERILISATION
Camera head with cable and connector can be immersed in a disinfectant solution (using attached cap).

PROGRESSIVE SCAN
Creates a picture signal with double the scan lines of a conventional interlaced picture to create a noticeably sharper image. It offers higher picture quality and eliminates virtually all motion artifacts.

CHARACTER GENERATOR
Creates On-Screen-Information on all video outputs by using standard PS2 keyboards (keyboard optional, see page 7).

Delivery contains
CCU, camera head with 4 meter cable, mains cable, HDMI-DVI cable, HDMI cable, RGB cable, Y/C cable, BNC cable, user manual.

Camera accessories

Focus	**TV-Adapter**
15 mm	**H97-250-000**
21 mm	**H97-250-001**
28 mm	**H97-250-002**
35 mm	**H97-250-003**

Focus	**TV-Adapter** **for flexible Endoscopes** (Pentax, Olympus, Fuji)
15 mm	**H97-250-200**
21 mm	**H97-250-201**

Focus	***HD* TV-Adapter**
14 mm	**H97-250-503**
25 mm	**H97-250-501**
28 mm	**H97-250-502**

Focus	**Zoom-Adapter** automatic focus
15 mm - 35 mm	**H97-250-400**

Focus	**TV-Zoom** manual focus
15 mm - 25 mm	**H97-250-100**
25 mm - 40 mm	**H97-250-101**

Focus	**Beamsplitter**
25 mm	**H97-250-300**
30 mm	**H97-250-301**

Cold light cables with adapters

Autoclavable, high flexibility and tensile strength

Ø 3,5 mm		Ø 4,8 mm	
180 cm	H91-180-035	180 cm	H91-180-045
230 cm	H91-230-035	230 cm	H91-230-045
300 cm	H91-300-035	300 cm	H91-300-045

Interchangeable adapters ensure, that the light sources can be operated with all types of endoscopes. If not stated differently we will supply fitting to Storz connection.

These cables are also available in blue, green, yellow and red

Cold light cables without adapters

Autoclavable, high flexibility and tensile strength

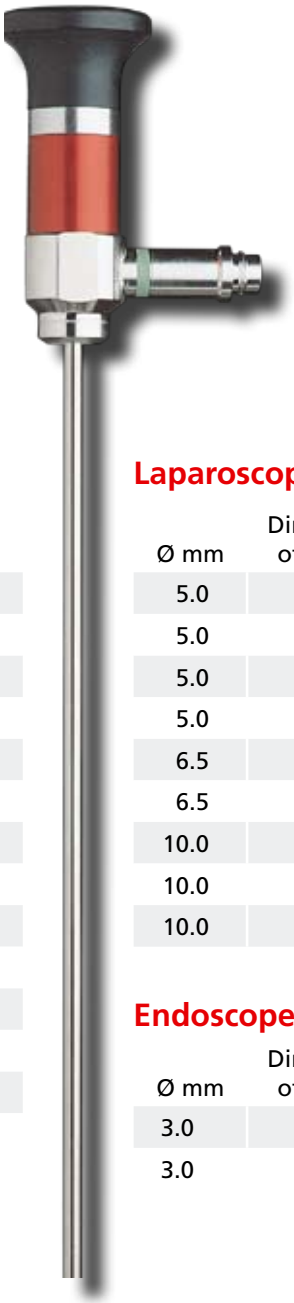
Ø 3,5 mm		Ø 4,8 mm	
180 cm	H91-180-135	180 cm	H91-180-145
230 cm	H91-230-135	230 cm	H91-230-145
300 cm	H91-300-135	300 cm	H91-300-145

Light guide adapters

Instrument side	
Adapter Storz / Winter / Olympus / B. Braun	H91-100-001
Adapter HSW / Wolf / Richards / Dyonics	H91-100-002
Adapter ACMI / British Standard / Stryker	H91-100-003

Projector side	
Adapter Storz	H91-100-010
Adapter Wolf / Richards	H91-100-020
Adapter Olympus	H91-100-030
Adapter ACMI / British Standard / Stryker	H91-100-050

Scopes HD autoclavable



Arthroscopes HD

Ø mm	Direction of view	working lengths mm	
2.7	0°	110	H84-027-000
2.7	30°	110	H84-027-030
2.7	70°	110	H84-027-070
2.7	0°	175	H84-127-000
2.7	30°	175	H84-127-030
2.7	70°	175	H84-127-070
2.7	0°	187,5	H84-227-000
2.7	30°	187,5	H84-227-030
2.7	70°	187,5	H84-227-070
4.0	0°	175	H84-040-000
4.0	30°	175	H84-040-030
4.0	45°	175	H84-040-045
4.0	70°	175	H84-040-070

Laparoscopes HD

Ø mm	Direction of view	working lengths mm	
5.0	0°	300	H83-050-000
5.0	30°	300	H83-050-030
5.0	45°	300	H83-050-045
5.0	70°	300	H83-050-070
6.5	0°	300	H83-070-000
6.5	30°	300	H83-070-030
10.0	0°	310	H83-100-000
10.0	30°	310	H83-100-030
10.0	45°	310	H83-100-045

Endoscopes HD

Ø mm	Direction of view	working lengths mm	
3.0	0°	187,0	H83-030-100
3.0	30°	187,5	H83-030-130

Cystoscopes HD

Ø mm	Direction of view	working lengths mm	
2.0	0°	187.5	H82-020-000
2.0	30°	187.5	H82-020-030
2.7	0°	187.5	H82-187-000
2.7	30°	187.5	H82-187-030
2.7	70°	187.5	H82-187-070
2.7	0°	302	H82-027-000
2.7	30°	302	H82-027-030
2.7	70°	302	H82-027-070
4.0	0°	302	H82-430-000
4.0	30°	302	H82-430-030
4.0	70°	302	H82-430-070
4.0	12°	302	H82-430-012

Hysteroscopes HD

Ø mm	Direction of view	working lengths mm	
2.7	0°	302	H85-027-000
2.7	12°	302	H85-027-012
2.7	30°	302	H85-027-030
2.7	70°	302	H85-027-070
4.0	0°	302	H85-040-000
4,0	12°	302	H85-040-012
4,0	30°	302	H85-040-030
4,0	70°	302	H85-040-070

HF-Generators

Easy to use
The main functions of the diathermy unit are divided into different groups to avert any confusion of the user. The most popular settings can be saved with the built in memory function. Easy power adjusting by push buttons.

Four cutting modes
The device is equipped with four different cutting modes. Pure cut, two different coagulation cutting types and an additional cutting mode for the use under water (TUR).

Four coagulation modes
Soft coagulation and forced coagulation as well as spray and universal coagulation.

Polypectomy and Papillotomy
The system is equipped with alternating cut and coagulation functions for operations like polypectomy and papillotomy. The polypectomy and papillotomy programm is already integrated into the models HHF 350, HHF 350 A, HHF 350A Thermostapler and HHF 400.

Two monopolar outputs
The HHF 350 A and HHF 400 system is equipped with an additional monopolar output with independent setting possibility.

Argon gas coagulation
The use of Argon gas (an inert, non-reactive gas) offers the surgeon the following benefits:
Improved visibility due to less smoke formation.
Contact free coagulation.
Efficient coagulation at lower power.

Safety
A specially designed microprocessor is used for monitoring the cutting modus 200 times every second. A built in overload-function controls the activation time and protects the system against overheating and other damages.
Every time the unit is switched on, it is running through a self test.

Delivery contains: HF-Generator
Mains cable
User manual

HHF 120	H98-120-000
POWER SUPPLY	
Supply voltage	230 V, 50 Hz
Rated power input	200 W
SAFETY FEATURES	
Protection against electric shock:	
Class	I
Grade	CF
Low-frequency leakage currents	according to IEC 60601-1
High-frequency leakage currents	according to IEC 60601-2-2
Generator operation frequency	416 kHz
Defibrillation impulse resistance	according to EN 60601-1
NEM System	neutral electrode control
AUTOTEST	self-test of generator and accessories after switching the power on, service codes display
OVERLOAD	generator overload protection
MONOPOLAR CUTTING	
Pure cutting	120 W for 300 Ω
Blend cutting	80 W for 300 Ω
MONOPOLAR COAGULATION	
Soft coagulation	80 W for 50 Ω
Forced coagulation	80 W for 300 Ω
ADDITIONAL FUNCTIONS	
Bipolar coagulation (special cable required H98-903-430)	80 W for 50 Ω
WEIGHT AND DIMENSIONS	
Length	360 mm
Width	240 mm
Height	105 mm
Weight	3.5 kg

HHF 300	H98-300-000
POWER SUPPLY	
Supply voltage	230 V, 50 Hz
Rated power input	350 W
SAFETY FEATURES	
Protection against electric shock:	
Class	I
Grade	CF
Low-frequency leakage currents	according to EN 60601-1
High-frequency leakage currents	according to EN 60601-2-2
Generator operation frequency	357 kHz
Defibrillation impulse resistance	according to EN 60601-1
NEM System	neutral electrode control
AUTOTEST	self-test of generator and accessories after switching the power on, service codes display
OVERLOAD	generator overload protection

MONOPOLAR CUTTING	
Pure cutting	250 W for 300 Ω
Blend cutting	250 W for 300 Ω
MONOPOLAR COAGULATION	
Soft coagulation	150 W for 50 Ω
Forced coagulation	150 W for 300 Ω
BIPOLAR COAGULATION	
Bipolar coagulation	100 W for 50 Ω
Auto-Start / Auto-Stop	automatic start and stop of bipolar coagulation
OTHER FEATURES	
PowerStart System	simplify the beginning of cutting process
SURGILOGIC System	automatic power regulation depends on needs
WEIGHT AND DIMENSIONS	
Length	380 mm
Width	340 mm
Height	165 mm
Weight	6.8 kg

Delivery contains: HF-Generator
Mains cable
User manual

HF-Generator

HHF 350	H98-350-000
POWER SUPPLY	
Supply voltage	230 V, 50 Hz
Rated power input	500 W
SAFETY FEATURES	
Protection against electric shock:	
Class	I
Grade	CF
Low-frequency leakage currents	according to IEC 601-1
High-frequency leakage currents	according to IEC 601-2-2
Generator operation frequency	357 kHz
Defibrillation impulse resistance	according to EN 60601-1
NEM System	neutral electrode application control
AUTOTEST	self-test of generator and accessories after switching the power on, service codes display
OVERLOAD	generator overload protection

MONOPOLAR CUTTING	
Pure cutting	350 W / Vpp 1000 V for 300 Ω
Blend cutting I	180 W / Vpp 1000 V for 300 Ω
Blend cutting II	150 W / Vpp 1150 V for 300 Ω
Blend cutting III	150 W / Vpp 1250 V for 300 Ω
Cutting with desiccation	150 W / for 50 Ω
Cutting in water environment	350 W / Vpp 1000 V for 300 Ω
MONOPOLAR COAGULATION	
Soft coagulation	180 W / Vpp 300 V for 50 Ω
Forced coagulation	180 W / Vpp 1150 V for 300 Ω
Spray coagulation	80 W / Vpp 3500 V for 1250 Ω
Universal coagulation	80 W / Vpp 3500 V for 1250 Ω
BIPOLAR COAGULATION	
Bipolar coagulation	120 W / Vpp 250 V for 50 Ω
Auto-Start / Auto-Stop	automatic start and stop of bipolar coagulation
BIPOLAR CUTTING	
Bipolar cutting (4 different levels of haemostasis)	100 W / Vpp 550 V for 300 Ω
Bipolar cutting in water environment	350 W / Vpp 450 V for 50 Ω
OTHER FEATURES	
PowerStart System	simplify the beginning of cutting process
SURGILOGIC System	automatic power regulation depends on needs
PP program	alternating cut and coag - 9 levels
Program memory	9 different memory locations
MultiSwitch	remote program selection with using MultiSwitch footswitch
WEIGHT AND DIMENSIONS	
Length	410 mm
Width	415 mm
Height	180 mm
Weight	8.3 kg

Delivery contains: HF-Generator
Mains cable
User manual

HF-Generator

HHF 400	H98-350-002
POWER SUPPLY	
Supply voltage	230 V, 50 Hz
Rated power input	500 W
SAFETY FEATURES	
Protection against electric shock:	
Class	I
Grade	CF
Low-frequency leakage currents	according to IEC 601-1
High-frequency leakage currents	according to IEC 601-2-2
Generator operation frequency	357 kHz
Defibrillation impulse resistance	according to EN 60601-1
NEM System	neutral electrode application control
AUTOTEST	self-test of generator and accessories after switching the power on, service codes display
OVERLOAD	generator overload protection
MONOPOLAR CUTTING	
Pure cutting	350 W for 300 Ω
Blend cutting I	180 W for 300 Ω
Blend cutting II	150 W for 300 Ω
Blend cutting III	150 W for 300 Ω
Cutting with desiccation	150 W for 50 Ω
Cutting in water environment	350 W for 300 Ω

MONOPOLAR COAGULATION	
Soft coagulation	180 W for 50 Ω
Forced coagulation	180 W for 300 Ω
Spray coagulation	80 W for 1250 Ω
Universal coagulation	80 W for 1250 Ω
BIPOLAR COAGULATION	
Bipolar coagulation	120 W for 50 Ω
Auto-Start / Auto-Stop	automatic start and stop of bipolar coagulation
BIPOLAR CUTTING	
Bipolar cutting (4 different levels of haemostasis)	100 W for 300 Ω
Bipolar cutting in water environment	350 W for 50 Ω
OTHER FEATURES	
PowerStart System	simplify the beginning of cutting process
SURGILOGIC System	automatic power regulation depends on needs
PP program	alternating cut&coag – endoscopic program
Program memory	9 different memory locations
MultiSwitch	remote program selection with MultiSwitch footswitch
ADDITIONAL MONOPOLAR OUTPUT	equipped with 2 monopolar outputs, 1 bipolar
WEIGHT AND DIMENSIONS	
Length	410 mm
Width	415 mm
Height	180 mm
Weight	8.1 kg

Delivery contains: HF-Generator
Mains cable
User manual

HF-Generator with Argon gas

HHF 350 A	H98-350-001
POWER SUPPLY	
Supply voltage	230 V, 50 Hz
Rated power input	500 W
SAFETY FEATURES	
Protection against electric shock:	
Class	I
Grade	CF
Low-frequency leakage currents	according to IEC 60601-1
High-frequency leakage currents	according to IEC 60601-2-2
Generator operation frequency	357 kHz
Defibrillation impulse resistance	according to EN 60601-1
NEM System	neutral electrode application control
AUTOTEST	self-test of generator and accessories after switching the power on, service codes display
OVERLOAD	generator overload protection
MONOPOLAR CUTTING	
Pure cutting	350 W for 300 Ω
Blend cutting I	180 W for 300 Ω
Blend cutting II	150 W for 300 Ω
Blend cutting III	150 W for 300 Ω
Cutting with desiccation	150 W for 50 Ω
Cutting in water environment	350 W for 300 Ω
Argon cutting	350 W for 300 Ω

MONOPOLAR COAGULATION	
Soft coagulation	180 W for 50 Ω
Forced coagulation	180 W for 300 Ω
Spray coagulation	80 W for 1250 Ω
Universal coagulation	80 W for 1250 Ω
Argon coagulation	80 W for 1250 Ω
Argon pulse coagulation	80 W for 1250 Ω
BIPOLAR COAGULATION	
Bipolar coagulation	120 W for 50 Ω
Auto-Start / Auto-Stop	automatic start and stop of bipolar coagulation
BIPOLAR CUTTING	
Bipolar cutting (4 different levels of haemostasis)	100 W for 300 Ω
Bipolar cutting in water environment	350 W for 50 Ω
ARGON	
Gas type	pure argon 4.8 (99,999%)
Inlet gas pressure	0.25 – 0.4 MPa
Gas outflow	0.1 – 9.9 l/min, regulated 0.1 l/min in whole operation range
Pressure gauge	reducer (0.4MPa) on argon cylinder
OTHER FEATURES	
PowerStart System	simplify the beginning of cutting process
SURGILOGIC System	automatic power regulation depends on needs
PP program	alternating cut&coag – endoscopic program
Program memory	9 different memory locations
Outputs	2 monopolar, 1 bipolar
MultiSwitch	remote program selection with using MultiSwitch footswitch
WEIGHT AND DIMENSIONS	
Length	420 mm
Width	415 mm
Height	180 mm
Weight	9.4 kg

Delivery contains: HF-Generator
Mains cable
User manual

HF-Generator with Argon gas and ThermoStapler

HHF 350 ARGON ThermoStapler	H98-350-003
POWER SUPPLY	
Supply voltage	230 V, 50 Hz
Rated power input	500 W
SAFETY FEATURES	
Protection against electric shock:	
Class	I
Grade	CF
Low-frequency leakage currents	according to IEC 60601-1
High-frequency leakage currents	according to IEC 60601-2-2
Generator operation frequency	357 kHz
Defibrillation impulse resistance	according to EN 60601-1
NEM System	neutral electrode application control
AUTOTEST	self-test of generator and accessories after switching the power on, service codes display
OVERLOAD	generator overload protection
MONOPOLAR CUTTING	
Pure cutting	350 W for 300 Ω
Blend cutting I	180 W for 300 Ω
Blend cutting II	150 W for 300 Ω
Blend cutting III	150 W for 300 Ω
Cutting with desiccation	150 W for 50 Ω
Cutting in water environment	350 W for 300 Ω
Argon cutting	350 W for 300 Ω

MONOPOLAR COAGULATION	
Soft coagulation	180 W for 50 Ω
Forced coagulation	180 W for 300 Ω
Spray coagulation	80 W for 1250 Ω
Universal coagulation	80 W for 1250 Ω
Argon coagulation	80 W for 1250 Ω
Argon pulse coagulation	80 W for 1250 Ω
BIPOLAR COAGULATION	
Bipolar coagulation	120 W for 50 Ω
Auto-Start / Auto-Stop	automatic start and stop of bipolar coagulation
BIPOLAR CUTTING	
Bipolar cutting (4 different levels of haemostasis)	100 W for 300 Ω
Bipolar cutting in water environment	350 W for 50 Ω
THERMOSTAPLER	
Vessel sealing	250 W for 50 Ω
Auto-Stop	automatic stop of sealing process after achieving the optimal effect
ARGON	
Gas type	pure argon 4.8 (99,999%)
Inlet gas pressure	0.25 – 0.4 MPa
Gas outflow	0.1 – 9.91 l/min, regulated 0.1 l/min in whole operation range
Pressure gauge	reducer (0.4MPa) on argon cylinder
OTHER FEATURES	
PowerStart System	simplify the beginning of cutting process
SURGILOGIC System	automatic power regulation depends on needs
PP program	alternating cut&coag – endoscopic program
Program memory	9 different memory locations
Output	2 monopolar, 1 bipolar, 1 ThermoStapler
MultiSwitch	remote program selection with using MultiSwitch footswitch
WEIGHT AND DIMENSIONS	
Length	420 mm
Width	415 mm
Height	180 mm
Weight	9.5 kg

Foot switches
for Hermann generators

H98-912-010 Single foot switch MINI,
6-pin plug
for H98-120-000 generator

H98-912-021 Double foot switch,
6-pin plug,
OR proofed for
H98-120-000
H98-300-000
H98-350-000
H98-350-001
H98-350-002
H98-350-003 generators

H98-912-030 Big double foot switch,
„MultiSwitch“
three button foot switch,
6-pin plug,
OR proofed for
H98-300-000
H98-350-000
H98-350-001
H98-350-002
H98-350-003 generators

Trolley

H98-913-001 Trolley for Hermann generators

H98-912-002 Argon Filter Set, sterile, single use, packing unit 50 pcs.

Suction / Irrigation Unit

The HSS-3000 is a powerful suction and irrigation pump for all surgical applications. The system works fully automatical. During the work, no adjustments are necessary. Overpressure in the irrigation bottle and underpressure in the suction bottle are controlled and ballanced by high sensitive electronical sensors and microcontroller. The automatic stand-by function keeps the pressures available and reduces the noise if the system is not used.

The use of disposable sterile air filters avoids contamination of the HSS-3000 and the irrigation liquid by contaminated air.

All accessories like tubes, suction bottle and puncture tube are fully autoclavable.

The HSS-3000 is very simple to install and easy to use.

Accessories

Tube-Set (silicon)	H94-000-050
Thorn for rinsing bottle autoclavable	H94-000-060
Suction bottle 2ltr.	H94-000-080
Holder for suction bottle	H94-000-090
sterile filter for suction-irrigation pump	H94-000-100

These accessories are included in the unit H94-000-000 but can also be ordered as spare parts

HSS-3000	H94-000-000
Power supply	115 VAC and 230 VAC switchable
Irrigation	3000 ml / min
Suction	3000 ml / min
Class / Type	BF
Weight	5.5 kg
Dimensions	355 x 105 x 253 mm (W x D x H)

- ❖ High flow system with 3 liters / minutes
- ❖ Filter system for sterility
- ❖ Full automatic, no adjustments required
- ❖ Stand-By function for noice and wear decrease

Delivery contains: Suction / Irrigation Unit
2 liter suction bottle with holder
2 sterile filter
1 Silicon tube set for suction
1 Silicon tube set for irrigation
1 Puncture tube for rinsing bottle
1 Mains Cable

Arthroscopy pump

The arthroscopic pump ensures that you have a clear view of the operation area, thanks to **continuous rinsing.** Control is realised by an automatic pressure regulator that adapts the flow to pressure conditions. Pressure can be set continuously to suit the operation, facilitating the operative intervention considerably. Pressure loss compensation is realised both rapidly and with great precision.

Perfected technology and excellent workmanship are your guarantee of superior quality and a long service life.

	H94-100-000
Power supply	230 V AC / 50 Hz
Max power consumption	70VA
Pressure setting range	0-280 mm Hg
Pressure control	electronical
Protection class	1 / Type BF
Dimensions	323x160x267 mm (WxHxD)
Weight	12 kg
Accessories compulsory	
Tube System (patient part) sterile, single use packing unit 20 pcs.	H94-100-100
Tube System (pump part) sterile, single use packing unit 10 pcs.	H94-100-101
Pressure sensor „sterile" (disposable)	H94-100-102

Shaver-System

The shaver system is designed for operative interventions involving small and large joints. It consists of a control unit, hand piece and a pedal switch.

User comfort is greatly enhanced, enabling optimum working results. The direction of rotation and rotation speed can be set directly on the control unit or with the pedal switch. The pedal switch is covered with non-slip material and sealed against the effects of liquids.

The hand piece runs extremely quietly, and its excellent shape characteristics greatly facilitate use while reducing hand fatigue. Suction capacity is greatly enhanced, and the complete hand piece can also be autoclaved.

	H93-000-000
Power supply	90 - 240 VAC
Frequency	50 Hz / 60 Hz
Fuse	2 x T 6.3A
Protection class	1, Type B
Dimensions	323 x 118 x 267 mm (W x H x D)
Weight	4 kg
Mode of operation	Intermittent operation with short time loading of 3 minutes continuous- running operating

Hand piece	H93-000-103
Length	165 mm
Weight	475 g
Speed range	1000 / 1500 / 2000 / 2500 / 3000 / 5000 / 8000 rpm
Oscillating Cycle	0.3 - 1.2 s
Cable length	3 m
Operating mode	intermittent mode – 3 minutes ON / 3 minutes OFF (at max speed)

Foot switch	H93-000-102
Dimensions	266 x 20 x 209 mm (W x H x D)
Weight	1.4 kg
Mode of operation	Clockwise, Counterclockwise, Oscillation, Speed Level Adjustment
Cable length	3 m

Shaver Blades

Useable for Hermann-, Linvatec/Concept-, Arthrex-, Atlantec- und Friatec-Shaver

Pck.-unit 5pcs.

			autoclavable / completely stainless steal		
			Ø 3.5 mm	Ø 4.2 mm	Ø 5.5 mm
	Aggressive Full- Radius Resector	straight	H93-035-000	H93-042-000	H93-055-000
	Meniscus Cutter	straight	H93-035-001	H93-042-001	H93-055-001
	Full-Radius Resector	straight	H93-035-002	H93-042-002	H93-055-002
	Incisor	straight	H93-035-003	H93-042-003	H93-055-003
	Trimmer	straight	H93-035-007	H93-042-007	H93-055-007
	Round Burr	straight	-	H93-042-004	H93-055-004
	Tapered Burr	straight	-	-	H93-055-005
	Oval Burr	straight	-	-	H93-055-006

Saw	H93-000-120
Length	190 mm
Weight	450 g
Speed range	20.000 rpm/min
Water proof	yes
Autoclavable	yes
Cable length	3 m
Operating mode	short time use
Maintenance free	yes

Drilling machine	H93-000-130
Length	165 mm
Weight	840 g
Speed range	100 / 250 / 400 / 550 / 700 rpm/min
Includes drill chuck key	yes
Water proof	yes
Autoclavable	yes
Cable length	3 m
Operating mode	short time use
Maintenance free	yes

Printer

	H98-000-001 (SONY UP-21MD)
Printing method	Colour dye-sublimation
Resolution	403 dpi (1664 dots)
Colour gradations	256 gradations for yellow, magenta, cyan; over 16.7 million colours per dot
Paper size	A6 S-Format 100 x 90 mm A6 L-Format 144 x 100 mm
Printed area	S format Full frame 95.8 x 72.7 mm Dual split 68.3 x 47.7 mm L format Full frame 126.9 x 91.9 mm Dual split 87.7 x 63.4 mm Quadruple split 63.5 x 45.9 mm
Print speed	UPC-21S approx. 17 seconds UPC-21L approx. 25 seconds
Remote controller	Remote 1 (Special mini jack) for optional RM-5500 unit Remote 2 (3,5mm mini jack) for optional RM-91, FS-20/FS-36 units RS-232C (D-sub 25-pin) for external computer
Frame memory	4 frame memory*
Inputs/Outputs	Video, S-Video, RGB
Power requirements	100-120 V, 50/60 Hz 220-240 V, 50/60 Hz
Power consumption	100-120 V: 1.8 A, 220-240 V: 1.0 A
Dimensions (WHD)	212 (W) x 125 (H) x 395 (D) mm
Mass	approx. 6.5 kg
Safety standards	UL2601-1, CSA C22.2 No. 601.1, EN60601-1 CE: LVD, MDD

DVD Recorder

	H98-000-002 (Sony DVO-1000MD)
General	
Power requirements	AC 100V to 240V, 50/60 Hz
Dimensions	212 x 128.5 x 382 mm
Mass	6 kg
Recording Format	Video: MPEG-2 compression Audio: Dolby Digital format
Recording Media	DVD+RW (2.4x and 4x speed)
Medical Standards	EN60601-1, DN60601-1-2, UL60601-1, CSA C22.2 No. 60601.1
Input/Output	
Analogue Composite Input	BNCx2, with loop-through
S-Video Input	4-pin DIN x 2, with loop-through
Analogue Composite Output	BNCx1
S-Video Output	4-pin DIN x 1
Analogue Audio Input	RCA Pin x 2 (L/R)
Analogue Audio Output	RCA Pin x 2 (L/R)
Monitor Audio Output	Monitor RCA Pin x 1
i.LINK (DV IN)	i.LINK 6-pin x 1, IEEE1394
Remote Control	RS-232C x 1, D-sub 9-pin Remote 1 x 1, stereo mini jack (for SVRM-100A and DSRM-10 controllers) Remote 2 x 1, stereo mini jack (for FS-20 foot switch) USB 2.0 x 1 (full speed)
Supplied Accessories	
Canopus DVD InfoEditor	Editing Software
DPW120MD	DVD+RW Blank Disc
Protocol Manual	
Operation Manual	
Accessories	
DSRM-10	
Remote control unit	

Medical-LCD-Monitors

15“ = H96-200-015
17“ = H96-200-017
19“ = H96-200-019
20.1“ = H96-200-021

Technical specifiations for Medical-LCD-Monitors		H96-200-015	H96-200-017	H96-200-019	H96-200-021	
LCD-Display	Diagonal	**15.0**	**17.0**	**19.0**	**20.1**	**Inch**
	Visible area (X x Y)	304.1 x 228.1	337.9 x 270.3	376.9 x 301.5	408.4 x 306.3	mm
	Colour / Monochrome / Aspect ratio	s / - / 4:3	s / - / 5:4	s / - / 5:4	s / - / 4:3	
	Native resolution / Other resolutions	XGA / VGA - SXGA	SXGA / VGA - UXGA	SXGA / VGA - UXGA	UXGA / VGA - UXGA	
	HD norm	720p	720p	720p	720p	
	Pixel pitch	0.297 x 0.297	0.264 x 0.264	0.294 x 0.294	0.255 x 0.255	mm
	No. of colours / Grey scale values	16.2 M / 256	16.7 M / 256	16.7 M / 256	16.7 M / 256	
	Brightness / High brightness version	400 / -	270 / -	270 / -	300 / -	cd/m²
	Contrast	500 : 1	1500 : 1	800:1	800:1	
	Vision angle H / V	160 / 140	178 / 178	178 / 178	178 / 178	degree
	Response time (grey to grey)	8	7	7	8	ms
Timing	VGA / Video	s / s	s / s	s / s	s / s	
Video standards	PAL / NTSC / SECAM	s / s / s	s / s / s	s / s / s	s / s / s	
	PiP / Zoom / Freezemode	- / - / -	s / o / o	s / o / o	s / o / o	
Inputs / Outputs	RGB analogue / DVI digital	2 x / -	1 x / 1 x	1 x / 1 x	1 x / 1 x	
	FBAS / S-Video / HD-SDI	1 x / 1 x	1 x / 1 x / -	1 x / 1 x / -	1 x / 1 x / -	
Housing	Desktop / Dual monitor / Quadmonitor	s / o / o	s / o / o	s / o / o	s / o / o	
	Integration panel, rack, chassis	on request	on request	on request	on request	
	Mobile carrycase systems	o	o	o	o	
	Customer specification	o	o	o	o	
Housing material	Sheet steel / Stainless steel / Aluminium / Plastic	o / o / s / o	o / o / s / o	o / o / s / o	o / o / s / o	
Surface	Powder coated	s	s	s	s	
Housing colour	RAL 7035, 9003 or 9006 / customer specification	s / o	s / o	s / o	s / o	
VESA adaption	For adaption to any OP arm	100	100	100	100	
Installation examples	Wall mounting / Base support	o / o	o / o	o / o	o / o	
	Ceiling mounting / Support arm system	o / o	o / o	o / o	o / o	
Screen properties	Colour neutral, non-reflective/Laminated screen	s / o	s / o	s / o	s / o	
Operation	Membrane keyboard OSD, German / English	s	s	s	s	
	Touchscreen / IR remote control	o / o	o / o	o / o	o / o	
Power supply	Medical power unit complying with EN 60601-1	s	s	s	s	
	AC 90 - 264 V / 50 - 60 Hz	s	s	s	s	
Weight	approx.	3.0	4.5	5.2	6.3	kg

Legend: s = Standard, o = Option, - = not available, Q = Quarterly

HD-LCD-Monitors

19“ = H96-300-019
20.1“ = H96-200-521
24“ = H96-200-524
42“ = H96-200-542

Technical specifiations for Medical-LCD-Monitors		H96-300-019	H96-200-521	H96-200-524	
LCD-Display	Diagonal	**19.0**	**20.1**	**24**	**Inch**
	Visible area (X x Y)	376.9 x 301.5	408.4 x 306.3	518.4 x 324	mm
	Colour / Monochrome / Aspect ratio	s / - / 5:4	s / - / 4:3	s / - / 16:10	
	Native resolution / Other resolutions	SXGA / VGA - 1080p	UXGA / VGA - 1080p	WUXGA / VGA - 1080p	
	HD norm	1080p	1080p	1080p	
	Pixel pitch	0.294 x 0.294	0.255 x 0.255	0.270 x 0.270	mm
	No. of colours / Grey scale values	16.7 M / 256	16.7 M / 256	16.7 M / 256	
	Brightness / High brightness version	270 / -	300 / -	400 / -	cd/m²
	Contrast	800:1	800:1	1000:1	
	Vision angle H / V	178 / 178	178 / 178	178 / 178	degree
	Response time (grey to grey)	7	8	6	ms
Timing	VGA / Video	s / s	s / s	s / s	
Video standards	PAL / NTSC / SECAM	s / s / s	s / s / s	s / s / s	
	PiP / PbP / Zoom / Freezemode	s / s / o / o	s / s / o / o	s / s / s / s	
Inputs / Outputs	RGB analogue / DVI digital	1 x / 1 x	1 x / 1 x	1 x / 1 x	
	FBAS / S-Video / HD-SDI	1 x / 1 x / o	1 x / 1 x / o	1 x / 1 x / o	
Housing	Desktop / Dual monitor / Quadmonitor	s / o / o	s / o / o	s / o / o	
Housing material	Sheet steel / Stainless steel / Aluminium / Plastic	o / o / s / o	o / o / s / o	o / o / s / o	
Surface	Powder coated	s	s	s	
Housing colour	RAL 7035, 9003 or 9006 / customer specification	s / o	s / o	s / o	
VESA adaption	For adaption to any OP arm	100	100	100	
Installation examples	Wall mounting / Base support	o / o	o / o	o / o	
	Ceiling mounting / Support arm system	o / o	o / o	o / o	
Screen properties	Colour neutral, non-reflective/Laminated screen	s / o	s / o	s / o	
Operation	Membrane keyboard OSD, German / English	s	s	s	
	Touchscreen / IR remote control	o / o	o / o	o / o	
Power supply	Medical power unit complying with EN 60601-1	s	s	s	
	AC90-264V / AC100-240V / 50-60Hz	s / - / s	s / - / s	- / s / s	
Weight	approx.	6.5	7.0	7.0	kg

Legend: s = Standard, o = Option, - = not available, Q = Quarterly

Table base support

adjustable for height, swivelling, rotatable,
working load max. 15kg
(suitable for 17" - 24" Monitors)

H96-200-100

Table base support

adjustable for height, swivelling, rotatable,
working load max. 12kg
(suitable for 17" - 24" Monitors)

H96-200-101

Wall mounting

(suitable for 15" - 19" Monitors)

H96-200-102

Wall mounting

with height adjustment
(suitable for 12" - 19" Monitors)

H96-200-103

Monitor holder central mounted; height adjustable; rotatable, inclinable; max bending range 190°, outreach 300mm, max. loading capacity 18Kg	**H96-200-106**
Rotary arm for monitor, lateral short height adjustable; side adjustable; inclinable; can be mounted on each side of th trolley; max bending range 190°; outreach 300mm, max. loading capacity: 15 Kg	**H96-200-107**
Rotary arm for monitor, lateral, long height adjustable, side adjustable, inclinable; can be mounted on each side of the trolley; max. bending range 190°, outreach 300mm; max. loading capacity 14 Kg	**H96-200-108**

Attention! Tilting danger of the trolley when overloaded!

Trolleys

Picture: Comfort-Model H99-000-001 and Power Box H99-000-101

BASIC-Model H99-000-000

5 deposit spaces
(continuously variable, each 50kg load capacity)

1 drawer

Castors, Ø100mm, antistatic

6 sockets with main on/off switch

Cable duct vertical

COMFORT-Model H99-000-001

5 deposit spaces
(continuously variable, each 50kg load capacity)

1 drawer

Castors, Ø125mm, antistatic

Power distributor 2x6 outlets with main on/off switch (no isolating transformer)

Cable duct vertical / horizontal

Handlebar

Accessories for Trolleys

Power Box with isolating transformer 2000 VA, NTC — H99-000-101

consists of:

1 X Power Box, complete

1 X Isolating transformer 2000 VA, 8 plug-in sockets, NTC starting current limiter

8 X POAG pin

1 X Assembly manual/description

Cable to connect endoscopic units with Power Box on request

Horizontal cable duct

Type Basic-Model — H99-000-100

Type Comfort-Model — H99-000-107

Supplements the vertical cable duct of the chassis to make a closed system

Optimal cable routing on the rear-side of the trolley

Removable cover for free access

Variable cable entry through sealing lip

Powder-coated, impact and scratch-resistant surface

Resistant to disinfectants

With cable winding aid

Recommendation: one horizontal cable duct per storage surface

Bottle holder — H99-000-102

For holding 5l and 10l bottles, max. Ø 145 mm

2-part

Secured with tension strap

Variable height adjustment

Accessories for Trolleys

Standard rail 10 X 25 H99-000-103

For side-mounting
on the front T-slot of the vertical profile
Variable height adjustment
With adapter
Maximum load: 10 kg
Length: 375 mm

Camera holder H99-000-104

For holding the camera head,
mounting on the front T-slot of the vertical profile
Variable height adjustment
Surface: black

Console, 2-arms H99-000-105

For extending the storage surfaces
laterally on the equipment trolley
With large 400 mm swivelling radius of action
Storage surface 310 X 310 mm
With two multifunction holders
For mounting on the front T-slot of the vertical profile
Variable height adjustment
Maximun load: 20 kg
(Caution! Danger of tipping over)

FIX-Pos Stand Security Corner Set H99-000-108

For attachment to cross piece, consoles, basic drawer
For preventing the installed equipment from slipping
Customized adaptation to your equipment
Surface: black

Vertical earth leakage monitor for isolating transformer H99-000-106

Standards and certification:
Protection class I product

Conformity and product verification according to the EU Medical Products Directive 93/42 EEC (Appendix I and Appendix VII)

Approval under EN 61 558-2-4 and EN 60 601-1

CE mark

Product Features:
System with integrated interface, retrofittable, expandable

Tasks:
Resistance measurement:

The device checks the insulation resistance of non-earthed alternating current networks. The operator is given a visual and acoustic warning when individual components fail.

Temperature monitoring:

Overload triggers the visual and acoustic warning.

Self check:
The isolation monitoring device automatically carries out a selfcheck at regular intervals. The operator is warned visually and by a signal tone if there is an accident.

Technical Data:	
Triggering value	50 kOhm
Test resistance	42 kOhm
Power supply voltage	230 V
Input voltage	90 - 250 V
Alternating current, internal resistance	220 kOhm
Direct current, internal resistance	320 kOhm
Measuring direct voltage	12 V
Peak value of measuring current	0,5 mA
Maximum permissible external direct voltage	250 V DC
Connecting cable	5 X 0,75 mm^2 with pin strip (for connecting to isolating transformer) Length of 3 m
Interface	Plug connection to isolating transformer

HERMANN
MEDIZINTECHNIK

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H93-035-007	25	H96-200-019	27	H97-250-100	10	H99-000-102	31
H93-042-000	25	H96-200-021	27	H97-250-101	10	H99-000-107	31
H93-042-001	25	H96-200-100	29	H97-250-503	10	H99-000-103	32
H93-042-002	25	H96-200-101	29	H97-250-501	10	H99-000-104	32
H93-042-003	25	H96-200-102	29	H97-250-502	10	H99-000-105	32
H93-042-004	25	H96-200-103	29	H97-250-300	10	H99-000-106	33
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